

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 03 10 00 – Concrete Forming and Accessories.
- .2 Section 03 30 00 – Cast in-Place Concrete.
- .3 Section 35 59 29 – Mooring Devices

1.2 MEASUREMENT FOR PAYMENT

- .1 No measurement or payment will be made under this Section. Include reinforcement costs in items of concrete work for which reinforcement is required.

1.3 REFERENCES

- .1 American Concrete Institute (ACI)
 - .1 ACI 315, Details and Detailing of Concrete Reinforcement
 - .2 ACI 315R, Manual of Engineering and Placing Drawings for Reinforced Concrete Structures
 - .3 SP-66, ACI Detailing Manual
- .2 ASTM International
 - .1 ASTM A82, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
 - .2 ASTM A185, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
 - .3 ASTM A775, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.
- .3 CSA International
 - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
 - .2 CAN/CSA-A23.3, Design of Concrete Structures
 - .3 CSA G30.3, Cold Drawn Steel Wire for Concrete Reinforcement.
 - .4 CSA G30.5, Welded Steel Wire Fabric for Concrete Reinforcement.
 - .5 CSA G30.14, Deformed Steel wire for Concrete Reinforcement
 - .6 CSA G30.15, Welded Deformed Steel Wire Fabric for Concrete Reinforcement
 - .7 CSA-G30.18, Billet Steel Bars for Concrete Reinforcement.
 - .8 CSA-G40.21, Structural Quality Steel
 - .9 CAN/CSA-G164, Hot Dip Galvanizing of Irregularly Shaped Articles.
 - .10 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.
- .4 Reinforcing Steel Institute of Canada (RSIC)

- .1 RSIC, Reinforcing Steel Manual of Standard Practice.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice and SP-66.
- .3 Shop Drawings:
 - .1 Indicate placing of reinforcement and:
 - .1 Bar bending details.
 - .2 Lists.
 - .3 Quantities of reinforcement.
 - .4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.
 - .5 Indicate sizes, spacings and locations of chairs, spacers and hangers.
 - .2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.
 - .1 Provide type C tension lap splices unless otherwise indicated.

1.5 QUALITY ASSURANCE

- .1 Submit in accordance with Section 01 45 00 – Testing and Quality Control
 - .1 Mill Test Report: provide Departmental Representative with certified copy of mill test report of reinforcing steel, minimum 4 weeks prior to beginning reinforcing work.
 - .2 Submit in writing to Departmental Representative proposed source of reinforcement material to be supplied.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirement: deliver material to site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's written instructions.
 - .2 Replace defective or damaged materials with new.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal and the Waste Reduction Workplan.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel
 - .1 Billet steel, grade 400W, deformed bars to CSA-G30.18, unless indicated otherwise.
 - .2 Weldable low alloy steel deformed bars to CAS-G30.18.
- .3 Cold-drawn annealed steel wire ties: to CSA G30.3.
- .4 Deformed steel wire for concrete reinforcement: to CSA G30.14.
- .5 Welded steel wire fabric: to CSA G30.5
 - .1 Provide in flat sheets only.
- .6 Welded deformed steel wire fabric: to CSA G30.15.
 - .1 Provide in flat sheets only.
- .7 Chairs, bolsters, bar supports, spacers: to CSA-A23.1A23.2.
 - .1 All reinforcement chairs to be plastic.
- .8 Mechanical splices: subject to approval of Departmental Representative.
- .9 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2, SP-66 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

- .5 All reinforcement steel to be continuous at corners.

2.3 SOURCE QUALITY CONTROL

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum 4 weeks prior to beginning reinforcing work.
- .2 Upon request inform Departmental Representative of proposed source of material to be supplied.

PART 3 EXECUTION

3.1 FIELD BENDING

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

3.2 PLACING REINFORCEMENT

- .1 Examine formwork to confirm it has been completed and adequately braced in place before starting reinforcement placing.
- .2 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2 and as follows:
 - .1 Clean all reinforcing of millscale, oil, grease, or other deleterious material before and after erection.
 - .2 Secure reinforcing steel rigidly in position with annealed wire or use approved clips at intersections supported on reinforcing chairs.
 - .3 Tie reinforcement where spacing in each direction is:
 - .1 Less than 300 mm: tie at alternate intersections
 - .2 300 mm or more: tie at each intersection.
 - .4 Do not allow the position of the bars to alter during concreting and maintain the correct cover at all times.
- .3 Prior to placing concrete obtain the Departmental Representative approval of reinforcing material and placement. Provide the Departmental Representative with a minimum of 48 hours notice when reinforcing material will be installed and ready for inspection.
- .4 Maintain cover to reinforcement during concrete pour. Cover to be 75 mm unless otherwise noted on the drawings. Use approved type chairs to locate the reinforcing steel at the proper grade.

- .5 Place all reinforcing bars and hold rigidly in the exact positions in the forms as shown on the approved plans or otherwise required. There must be no displacement of the reinforcement by the placing and tamping of the concrete. Adjusting or moving the bars while the concrete is being placed will not be permitted unless specified on the plans.
- .6 Do not place excess reinforcement steel in formwork.
- .7 Use plain round bars as slip dowels in concrete.
 - .1 Paint portion of dowel intended to move within hardened concrete with one coat of asphalt paint.
 - .2 When paint is dry, apply thick even film of mineral lubricating grease.

3.3 CLEANING

- .1 Clean reinforcing before placing concrete to CAN/CSA A23.1.

END OF SECTION